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Ghosts, surprises, and unsolved mysteries: a multi-technique approach to the enigmatic third guesthouse at Fountains Abbey

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INTRODUCTION

Founded in the first half of the 12th century, Fountains Abbey was one of the largest and wealthiest of England's Cistercian abbeys. Cistercian ideologies structured the construction of the abbeys and their landscapes in a regular manner as a physical manifestation of their piety to God. Because the abbey landscape was a sacred place, movement of visitors through the site was regulated (Coppack 2003). At Fountains Abbey, guest houses were constructed southwest of the nave, as movement from the east was reserved as a sacred entry into the site. Two of these guest houses remain partly freestanding to this day, with a third buried directly beneath the grassy area directly southwest of the nave. For such an important and iconic site, relatively little intrusive archaeological work has been conducted within the grounds. Much of the understanding of the site relies on written and illustrative sources. One of the enigmatic areas of the Fountains Abbey landscape is this so-called "third guest house." This buried guest house is not drawn or discussed in the earliest plans of the ruins. What was previously known of this building was primarily derived from the results of an a = 0.5 m twin-probe earth resistance survey, conducted in the early 1990s by the University of York. Geophysical investigations led by the University of Bradford in 2013 and 2014 have shed new light on this area.

In 2013, the University of Bradford began investigations over the area southwest of the nave as part of a public engagement for World Heritage Day. Investigations included an earth resistance survey using linear and non-linear arrays, electrical resistivity tomography, and fluxgate gradiometer methods. The range of additional survey techniques suggested a more complex buried landscape than previously believed. Further work undertaken in 2014 sought to better characterise and understand the changes of archaeology with depth. To accomplish this, high-resolution survey strategies were employed, along with multi-depth methods. The work utilised multi-channel ground-penetrating radar, cart-based earth resistance and magnetometry, earth resistance pseudosections, and multi-depth electromagnetic induction techniques.

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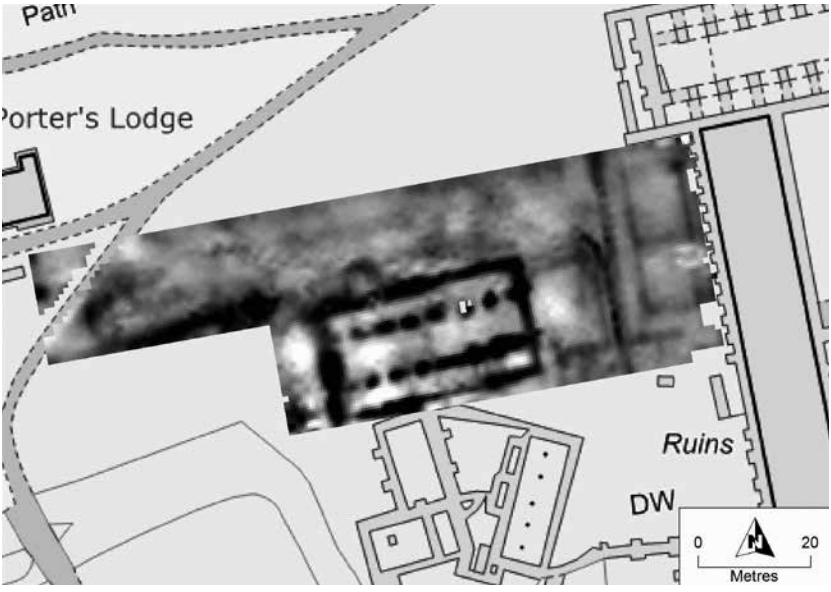

Fig. 1. Earth resistance results using an a=0.5 m twin-probe array. Data were despiked, high-pass filtered and interpolated, displayed from 1.5 SD (white [low] – high [black])

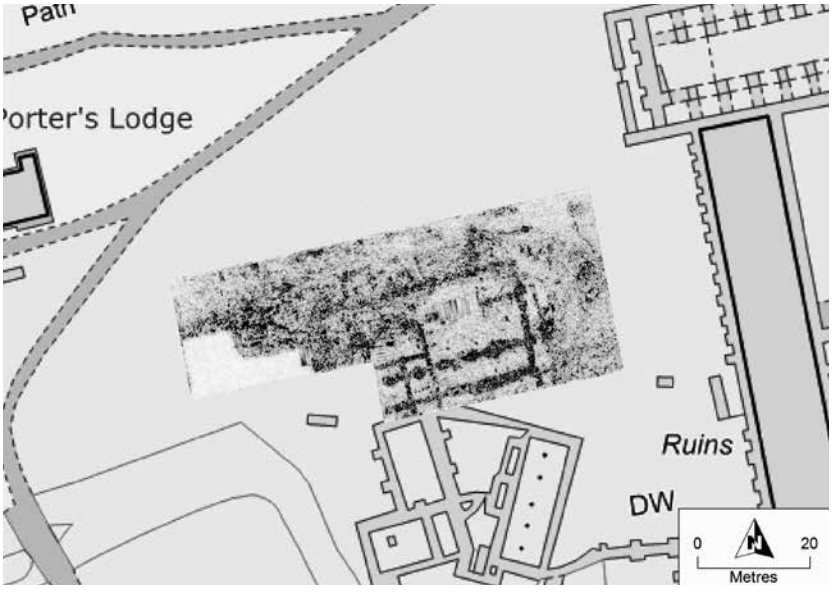

Fig. 2. GPR time slice correlating to a depth of 1.67 m (white [low] – high [black])

Of the range of prospection methods applied over the site, the earth resistance and ground penetrating radar methods were most successful for delineating the structure of the buried guest hall. As a result, these methods have provided us with the most information for developing the archaeological narrative for this structure and are thus the focus of this paper.

METHODS

Technique	Hardware	Sample Interval x Traverse Spacing	Comment
earth resistance: twin-probe array	Geoscan Research RM15	1.0 m x 0.5 m 1.0 m x 1.0 m	a=0.5 m a=1.0 m
earth resistance: square array	Geoscan Research RM85 on MSP25	0.25 m x 1.0 m	alpha, beta, gamma a=0.75 m
earth eesistance: expanding twin-probe pseudosections	Geoscan Research RM85	1.0 m x variable	a=0.25m, 0.5 m, 0.75 m, 1.0 m, 1.25 m, 1.5 m generated into pseudosections and run through 3D inversion
GPR	Mala Mini Mira	0.08 m x 0.08 m	400 MHz antennae

RESULTS

The buried guest house is clearly resolved in the earth resistance surveys, with the walls and pillar bases exhibiting high-contrast from the surrounding soil (Figs 1 and 3). These results agree with previous prospection work at the site. However, through the use of expanding arrays and different electrode configurations, the 2013 and 2014 earth resistance results hint at additional structural changes with increased depth (Fig. 1). These additional, previously unknown, structures are not visible in the 1990s twin-probe survey due to the shallower depth of detection of that survey. Still, the larger earth resistance arrays lacked the required resolution and depth of investigation to provide an adequate understanding of the nature of these anomalies. To better assess the deeper archaeological changes, a high-resolution ground penetrating radar survey was employed. The GPR results (Fig. 2, a selected representative time slice of the structures) delineate a series of walls, beyond a depth of 1.0 m. Because the ground penetrating radar results quantify the changes of features with depth that are visible between the various earth resistance surveys, the radar provided a baseline from which the results could be better understood in relation to one another.

The 2014 earth resistance surveys also utilised a cart-based system, allowing for a higher sampling density, which was able to resolve further internal structuring of the buried remains. The 2014 cart-based square gamma dataset has provided additional information regarding the structure of the guest hall walls, which combined with the radar data, has resulted in a re-evaluation of the 2013 survey results (Fig. 3).

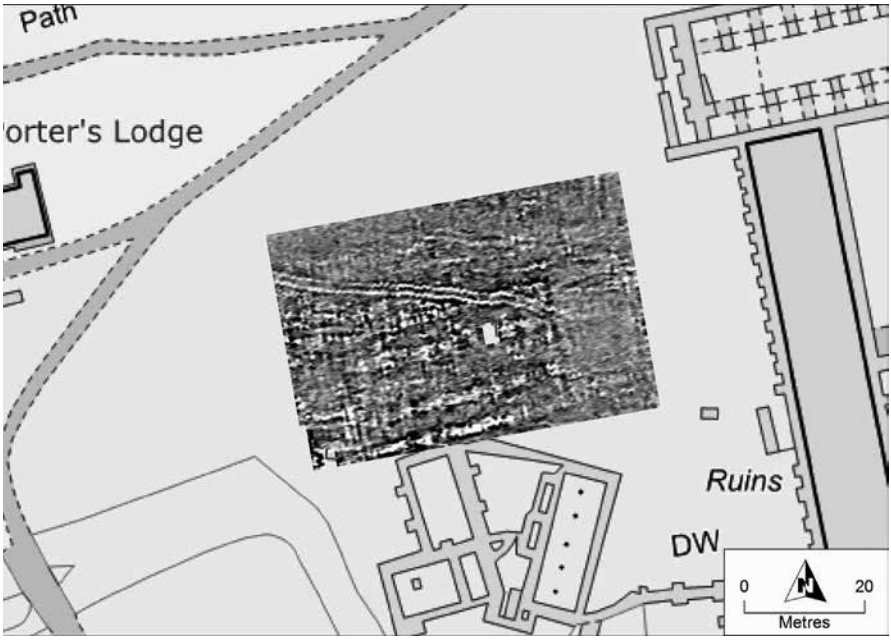

Fig. 3. Earth resistance results using an a=0.75 m square array in gamma configuration. Data were interpolated, displayed from 1.5 SD (white [low] – high [black])

CONCLUSIONS

The cumulative results from the 2013 and 2014 surveys at Fountains Abbey reveal a more complex subsurface than previously known. The multi-method strategy provided information beyond the structure of the buried remains, by revealing the complex changes of features with depth. Examining the geophysical results within the context of the abbey's development has led to the following working theory. From the 1140s–1220s, the abbey grew in size, wealth, and power; historical records describe this as a period of stimulated construction and expansion. With the accruement of wealth came further political administration and an influx of visitors to the site. The deeply buried walls, appearing beyond a depth of 1.0 m in the GPR data, likely formed a smaller guest house to the larger "third guest house," which is more shallow. We propose that the abbey could not accommodate the increased traffic of visitors to the site and demolished the more deeply buried smaller guest house to construct a larger guest house. Due to the lack of historical writings and illustrative sources describing this larger "third guest house", it is postulated that the building may have been constructed rapidly to accommodate less important visitors.

REFERENCES

Coppack, G. 2003. *Fountains Abbey: the Cistercians in northern England*. Stroud.